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PATENT COOPERATION TREATY

PCT/EP2003/008715



PCT 10/527428

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Translation

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| Applicant's or agent's file reference 2002P15038WO | FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) | |
| International application No. PCT/EP2003/008715 | International filing date (day/month/year) 06 August 2003 (06.08.2003) | Priority date (day/month/year) 12 September 2002 (12.09.2002) |
| International Patent Classification (IPC) or national classification and IPC G06F 11/16 | | |
| Applicant SIEMENS AKTIENGESELLSCHAFT | | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 7 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☒ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

| | |
|--|--|
| Date of submission of the demand 08 April 2004 (08.04.2004) | Date of completion of this report 18 February 2005 (18.02.2005) |
| Name and mailing address of the IPEA/EP | Authorized officer |
| Facsimile No. | Telephone No. |

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP2003/008715

I. Basis of the report

1. With regard to the elements of the international application:*

- ☐ the international application as originally filed
- ☒ the description:
 pages _____ 1-9 _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☒ the claims:
 pages _____ 1-7 _____, as originally filed
 pages _____, as amended (together with any statement under Article 19
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☒ the drawings:
 pages _____ 1/1 _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

- These elements were available or furnished to this Authority in the following language _____ which is:
- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.
- ☒ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
- ☐ not complied with for the following reasons:

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
- ☐ the parts relating to claims Nos. _____

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: BOX IV

This report makes reference to the following documents:

D1: US-A-5 384 906

D2: EP-A-0 104 490

D3: US-A-3 810 119

D4: WO 95/15529 A

D5: WO 93/09494 A

D6: WO 99/36847 A

D7: US-A-5 896 523

1. BOX IV - Lack of unity of invention

1.1 The International Preliminary Examination has determined that this international application contains multiple inventions, as follows:

1.1.1 Claims 1, 2, 5

Method and processor component for synchronising external events, the number of instructions executed by a processor since the change to a particular operating mode being counted and compared, ensuring that the external events are actually executed after a predetermined number of instructions and that the real-time nature of the method and processor component is preserved.

1.1.2 Claims: 3, 4, 6, 7

Method and system for synchronising external events, at least two components being provided which carry out instruction sequences invoking identical external events, the two components

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: **BOX IV**

checking each other's operability in a redundant manner.

1.1.3 The method as per claim 1 is known in its entirety from D1. The references in parentheses are to that document:

1.1.3.1 A synchronising method of (first and fourth sentences of the abstract)

1.1.3.2 external events (figure 3, 238; column 7, last sentence of second paragraph)

1.1.3.3 which are supplied to a component (figures 1 and 3, CPU-A) and influence the same (fourth sentence of the abstract),

1.1.3.4 the external events are buffered accordingly (figure 3, 210; column 7, second sentence of second paragraph),

1.1.3.5 the stored external events (198) being invoked for processing in a separate operating mode of operation ('Kernel mode', column 33, lines 37-40) of the component (figure 3, 180), the component entering this operating mode as a function of the fulfilment of a condition which can be predetermined or is permanently stipulated (OR 222) by commands.

1.1.4 The claimed method steps and features thus do not

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: **BOX IV**

represent special technical features which define a contribution over the prior art, as defined in PCT Rule 13.2, and do not meet the requirements of PCT Rule 13.1.

1.2 The applicant maintains that claim 1 defines a novel and special technical feature within the meaning of PCT Rule 13.2, namely the invocation of stored events, while D1 discloses the supply of external events. In the opinion of the International Preliminary Examination Authority, this is merely a linguistic and not a material technical difference, since the supply of events unavoidably requires the capacity to take over and hence to invoke said events.

1.3 Since the presence of common special technical features within the meaning of PCT Rule 13.1 and 13.2 is a necessary and indispensable condition to establish the unity of separately claimed inventions, and since this is not the case of the present application, for the above-mentioned reasons, the applicant's further arguments regarding unity of invention cannot be taken into consideration.

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|-------------------------------|--------|-------|-----|
| Novelty (N) | Claims | | YES |
| | Claims | 1 - 7 | NO |
| Inventive step (IS) | Claims | | YES |
| | Claims | 1 - 7 | NO |
| Industrial applicability (IA) | Claims | 1 - 7 | YES |
| | Claims | | NO |

2. Citations and explanations

Although a complete search covering the entire subject matter claimed was not carried out (see the international search report, further indications, PCT/ISA 210 form, sheet 2/2, last paragraph) and the International Searching Authority pointed out that it could not ascertain for which embodiments mentioned in the description protection could be rightly claimed, it is possible to ascertain, as described below, that the claimed subject matter is already known from the prior art uncovered during the incomplete search.

2.1 The above grounds substantiating lack of unity of invention show that all the features and method steps mentioned in claim 1 are known from D1. The claim therefore does not meet the requirements of PCT Article 33(2). The features defined in D1 which were neither defined in nor excluded from the present claims, i.e. the presence of a plurality of CPUs, do not substantiate novelty in patent law.

2.2 Moreover, D3 (references in parentheses ()), D4 (references in square brackets []), D3 (references in curly brackets {}), D6 (references in pointed

brackets<>) and D7 (references in double pointed brackets << >>) disclose the claimed subject matter of the second invention:

2.2.1 a system (figure 1) [claim 1, first three lines]
{figure 1} <figure 4> <<figure 1>>

2.2.2 comprising at least two processor components
(processors A and B) [claim 1, first three lines]
{130, 132, ... 140} <154, 156> <<105>>

2.2.3 each having at least the following elements: at
least one execution unit, at least one counter
element (figure 3, counters A and B) [page 5, line
33 - column 6, line 3] {page 10, lines 21-22} <page
10, line 36 - page 11, line 5> <<figure 4, 415>>>

2.2.4 for counting the instructions executed by the
execution unit since the last change to the special
operating mode (ON MAT) [Interrupt, page 6, lines 6-
9] {"interrupt", page 10, last line} <"preempt OR
interrupt"> <<figure 7, Lockstep Task Context>>,

2.2.5 at least one register element (column 2, lines 7-10)
["one hundred"] {"recovery register"} <"16-bit
counters that are capable of counting events">
<<figure 5, 505, 510>> whose contents can be
predetermined or are permanently stipulated by
commands,

2.2.6 at least one comparator element (COMPARATOR) [page
6, lines 6-9] {figure 3, 202} <page 11, lines 5-10>
<<column 10, lines 19-21>>

2.2.7 for switching the execution unit to a special

operating mode (MAT) ["interrupt"] {"interrupt"}
<"trap to an executive routine"> <<figure 7,
Lockstep Task Context>>, depending on whether the
counter element matches the register element,

- 2.2.8 external events which influence the processor components, are buffered in the special operating mode and are to be supplied to the processor components, being invoked by the latter (column 4, paragraph 2) [page 6, lines 29-31] {figure 3, "Buffered Interrupts", 205} <page 5, last line - page 6, line 10> <<figure 8, "Maskable Interrupt", column 3, lines 53-55>>.
- 2.3 The applicant's arguments in support of the second invention with respect to D3 to D7 cannot be accepted because features that are defined in those documents yet neither defined in nor excluded from the claims do not contribute to novelty in patent law, and the conventionality of the processors and motherboards used in those documents does not constitute an actual differentiating feature in view of the special adaptation in the presently claimed subject matter going beyond the prior art, which adaptation is merely maintained but not substantiated.
- 2.4 None of the remaining claims discloses features which are not already from the citations, and they therefore also fail to meet the novelty requirement.
3. **BOX VII - Certain defects in the international application**

- 3.1 Apart from the lack of unity, the application, in

particular the claims, is not drafted with the conciseness required by PCT Article 6. It is possible and, according to this requirement, necessary to define an allegedly inventive system (claim 6) by reference to its allegedly inventive component (claim 5). A system does not exist in relationship to its components, nor do the system and its components represent different uses of the same product or same device, nor is it a matter of alternative solutions to a particular problem, since the system can neither replace its components nor can an individual component replace the system.

- 3.2 Contrary to PCT Rule 5.1(a)(ii), the description does not cite documents D1 to D7 or indicate the relevant prior art disclosed therein.
- 3.3 The independent claims have not been drafted in the two-part form defined by PCT Rule 6.3(b). However, in the present case the two-part form would appear to be appropriate. Accordingly, the features known in combination from the prior art (document D1 for the first invention, D3-D7 for the second) should have been placed in the preamble (PCT Rule 6.3(b)(i)) and the remaining features specified in the characterising part (PCT Rule 6.3(b)(ii)).